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Original article

Validation of the WHO Quality of Life assessment instrument (WHOQOL-100) in a population of Dutch adult psychiatric outpatients

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Abstract

Background. – Research concerning the *psychometric properties* of the WHO Quality of Life Assessment Instrument (WHOQOL-100) in general populations of psychiatric outpatients has not been performed systematically.

Aims. – To examine the content validity, construct validity, and reliability of the WHOQOL-100 in a general population of Dutch adult psychiatric outpatients.

Method. – A total of 533 psychiatric outpatients entered the study (438 randomly selected, 85 internally referred). Participants completed self-administered questionnaires for measuring quality of life (WHOQOL-100), psychopathological symptoms (SCL-90), and perceived social support (PSSS). In addition, they underwent two semi-structured interviews in order to obtain Axis-I and Axis-II diagnoses, according to DSM-IV.

Results. – The drop-out percentage was low (7.1%). Of the 24 facets of the WHOQOL-100, 22 had a good distribution of scores, leaving out the facets physical environment and transport. Exploratory factor analysis revealed a four-factor structure, which was similar to earlier findings in patients with specific somatic diseases and depressive disorders. Various—a priori expected—positive and negative correlations were found between facets and domains of the WHOQOL-100, and dimensions of the SCL-90 and the PSSS-score, indicating good construct validity of the WHOQOL-100. The internal consistency of all facets and the four domains of the WHOQOL-100 was good (Cronbach's alpha's ranging from 0.62 to 0.93 and 0.64 to 0.84, respectively). Sparse and relatively low correlations were found between demographic characteristics (age and sex) and WHOQOL-100 scores.

Conclusions. – Content validity, construct validity, and reliability of the WHOQOL-100 in a population of adult Dutch psychiatric outpatients are good. The WHOQOL-100 appears to be a suitable instrument for measuring quality of life in adult psychiatric outpatients.

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Keywords: Quality of life; WHOQOL-100; Psychiatric outpatients

1. Introduction

Effects of psychiatric disorders on aspects of everyday life have become a field of growing interest in psychiatric research, with quality of life (QOL) being one of the main topics [23]. Another reason for the introduction of the QOL concept was that the predominance of classical medical endpoints, such as mortality and morbidity, was criticized for failing to represent adequately the potential outcomes of medical interventions [28].

From the 1980s onwards, many instruments have been developed for the assessment of functioning in daily life. Although these instruments often are labelled as general 'quality of life' measures, strictly speaking, they assess *health-related* quality of life (HRQOL) or health status. In HRQOL research, the aim is to assess *functioning itself* (e.g., with items like 'Can you walk 500 metres?'). In contrast, QOL research focusses on the *personal evaluation of functioning* (e.g., 'Are you satisfied with your mobility?'). The initial development of generic HRQOL instruments was followed by the development of disease-specific assessment instruments. Today, many instruments are available and the number of relevant studies has increased enormously [15,40]. HRQOL assess-

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ment instruments have been designed predominantly for patients with somatic diseases and, to a lesser extent, for patients with psychiatric disorders [23,35].

Over the past two decades, there has been a vehement debate regarding the assessment of (HR)QOL. This discussion has resulted in four principles. First, (HR)QOL should be measured in a *comprehensive* way, covering a broad range of domains and facets [7,22]. The second principle concerns the importance of *subjective measurement* by self-report questionnaires [7,25]. A third fundamental principle reflects the conviction that the *relative importance of various facets* of (HR)QOL is a crucial issue for the accuracy of the overall assessment of (HR)QOL [21,25]. Finally, the instruments for the assessment of (HR)QOL need to be *culturally sensitive*, and should contain questions that address culturally relevant issues and culturally relevant language [8,24,30].

1.1. The WHOQOL project

In 1991, the World Health Organization (WHO) started a project entitled 'The assessment of QOL in health care'. The aim was to develop an internationally applicable, cross-culturally comparable, generic, and multidimensional instrument for the assessment of QOL. The instrument was developed *simultaneously* in 15 centres around the world, including the Netherlands (Tilburg University being the Dutch participating centre) [11,12]. The questionnaire was labelled the World Health Organization Quality of Life assessment instrument (WHOQOL). In this project, QOL was defined as 'individuals' perception of their position in life within the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns' [37]. While many existing (HR)QOL measures only address *some* of the four principles mentioned above, the WHOQOL instrument meets *all* of them. The WHOQOL project has resulted in the development of the WHOQOL-100 [12,13,38] and, more recently, the WHOQOL-Bref [39].

Worldwide, the WHOQOL-100 has undergone testing on its psychometric aspects, which are qualified as good [38]. Generally, the WHOQOL-100 is considered a promising instrument for the assessment of QOL [6,12,28,31,40].

Up till now, research with the WHOQOL-100 has mainly focussed on patients with *somatic disorders* [15,16,32]. Studies with the WHOQOL-100 among patients with *psychiatric disorders* are scarce. In the few existing studies, which almost all focussed on depression, the psychometric qualities of the WHOQOL-100 were qualified as good to excellent [2,5,33].

Research concerning the *psychometric properties* of the WHOQOL-100 in general populations of psychiatric outpatients has not been performed systematically. Therefore, the aim of the present study was to examine the content validity, construct validity, and reliability of the WHOQOL-100 in a general population of adult psychiatric outpatients. Negative correlations were expected between somatic complaints and the WHOQOL-100 domain physical health and its facets, in particular the facet energy and fatigue, as well as between

sleeping problems and the WHOQOL-100 facet sleep and rest. In addition, we also expected significant associations between negative emotions and the WHOQOL-100 domain psychological health and its facets. Finally, the WHOQOL-100 domain social relationships and its facets were predicted to have positive correlations with perceived social support (PSSS).

2. Subjects and methods

2.1. Subjects

This study was conducted at GGZ Midden Brabant, the community mental health center in Tilburg, the Netherlands, after approval by the Medical Ethical Committee of the Southern Netherlands. Participants were outpatients of Dutch ethnic origin, referred to the center in the period from 1 March 2001 till 1 March 2002. Included were people aging 21–50 years. This age criterion was set to match the criteria of the employed questionnaires. Potential participants could enter the study in two ways. They (1) could enter the study through a random selection procedure (i.e., every third referral was directly selected for psychiatric evaluation) or (2) through internal referral by colleagues (i.e., psychologists asking for psychiatric consultation). After complete description of the study to the participants, written informed consent was obtained. Exclusion criteria were inability to undergo the various verbal and written parts of the investigation protocol (interviews and questionnaires) due to severe mental illness, illiteracy, dyslexia, mental retardation, problems with sight or hearing, cerebral damage, or refusal to participate.

During the 1-year period, 3892 people (male: 40.4%; female: 59.6%) were referred to the outpatient clinic of the center. About half of them ($N = 1559$) were potential participants (male: 42.2%; female: 57.8%). The total group that entered the study contained 533 participants (male: 46.2%; female: 53.8%); 438 participants (82.2%) entered the study through random selection (male: 42.7%; female: 57.3%), and 95 through internal referral (male: 62.1%; female: 37.9%). From the 438 randomly selected participants, 20 were unable to undergo the research protocol (i.e., they were not able to fill in the questionnaires and/or not able to undergo the interviews), due to severe psychotic disorder ($N = 7$), major depressive episode ($N = 9$), dyslexia ($N = 2$), and mental retardation ($N = 2$). Eight participants refused to participate (four diagnosed with antisocial personality disorder; four with substance related disorder). From the 95 internally referred participants, six were unable to undergo the research protocol, due to severe psychotic disorder ($N = 1$), substance related disorder ($N = 2$), mental retardation ($N = 1$), and severe visual handicap ($N = 2$). Four refused to participate (all diagnosed with antisocial personality disorder). Thus, from the total group of 533 participants, 495 fully completed the test booklet (92.9%; 410 through random selection and 85 by internal referral).

2.2. Measures

Participants were asked to complete self-administered questionnaires for measuring QOL, perceived social support, and psychopathological symptoms. In addition, they underwent two semi-structured interviews (held in two separate sessions) for obtaining Axis-I and Axis-II diagnoses, according to DSM IV. These diagnoses were collected to provide insight into the composition of the group of participants regarding their psychopathology.

2.2.1. Quality of life

Quality of life was measured using the WHOQOL-100 [37,38], Dutch version [11]. The WHOQOL-100 is a generic measure designed for use in a wide spectrum of psychological and physical disorders. It is a multidimensional measure for subjective assessment of QOL. During the development, focus groups of patients, health professionals, and well people proposed items that were selected and attached to a 5-point Likert scale. The 100 items are organised in 24 facets, subsumed within six domains [38] and one facet measuring overall QOL and general health. High scores indicate good QOL, except for the facets pain and discomfort, negative feelings, and dependence on medication or treatments, which are negatively framed. The time frame of reference is the previous two weeks. Regarding somatic diseases, the WHOQOL-100 has good to excellent validity and reliability [32].

2.2.2. Symptoms

Actual perceived symptoms were measured with the Symptoms Check List-90 (SCL-90 [10]), Dutch version [3]. The 90-item SCL is a multidimensional self-report inventory. The questions of the SCL-90 cover a major part of complaints that can be reported by psychiatric outpatients, with a 5-point rating scale ranging from 1, *totally not*, to 5, *very much*. The questions are grouped into dimensions, of which the following eight were used in this study: (1) anxiety, (2) phobic anxiety, (3) depression, (4) somatization, (5) insufficiency of thinking and acting, (6) paranoid ideation and interpersonal sensitivity, (7) hostility, and (8) sleep difficulty. Reliability and validity of the Dutch version of the SCL-90 are qualified as good [18].

2.2.3. Social support

The total score of the 12-item version of the PSSS [4,14] was used to assess general perception of social support. The rating scale varied from 1, *very strongly disagree*, to 7, *very strongly agree*. The PSSS has good reliability and validity [4].

2.2.4. DSM-IV, Axis-I diagnosis

For the Axis-I diagnosis, the Schedules for the Clinical Assessment in Neuropsychiatry (SCAN 2.1), were used [20,41]. The SCAN is a comprehensive semi-structured diagnostic interview, developed under auspices of the WHO, aimed at the assessment and classification of psychiatric dis-

orders in adults [20,41,42]. The interviews were administered by two psychiatrists (EDM, FJT) trained and certified at the WHO centre in Groningen, the Netherlands. Most of the studies about the psychometric properties of the SCAN have only examined earlier versions or parts of the current version [1,27]. Rijnders et al. [29] tested the psychometric properties of the integral SCAN 2.1. Overall reliability was qualified as moderate to substantial and, with regard to the test–retest situation, as fair to moderate. In the standardized situation using videotaped interviews by experts, sensitivity as well as specificity proved to be substantial to almost perfect.

2.2.5. DSM-IV, Axis-II diagnosis

For the Axis-II diagnosis, the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) [34], 2.0 [19], Dutch version [36], was used. The SCID-II, 2.0 is a semi-structured interview with 140 items, organized by diagnosis, covering the 10 personality disorders included in DSM-IV Axis II and the two personality disorders listed in the DSM-IV Appendix (i.e., diagnoses requiring further study). The instrument provides categorical diagnoses and dimensional scores for each disorder. With regard to the psychometric properties, Maffei et al. [26] investigated the interrater reliability and internal consistency. Interrater reliability was good for categorical diagnoses as well as dimensional diagnoses. Internal consistency for the dimensional scales proved to be satisfactory.

2.2.6. Demographical variables

Patients were asked to report age and sex. These variables were included because they seem to be important for the operationalization of QOL [17].

2.3. Statistical analyses

First, skewness (criteria: ≥ -0.50 or < 0.50) and kurtosis (criterion: negative sign) of the WHOQOL-100 items were calculated. Exploratory factor analysis was performed for examining content validity, using a combination of the Scree test [9] and interpretability. The four-domain structure of the WHOQOL-100 as found in previous, non-psychiatric studies, was examined with confirmatory factor analysis (CFA). In order to provide information on construct validity, Pearson correlations were calculated between the WHOQOL-100, on the one hand, and the SCL-90 and the PSSS, on the other hand. A *p*-value below 0.01 was considered significant, due to the large sample size. As measure of internal consistency, Cronbach's alpha's were calculated. To determine the relationship between WHOQOL-100 and sex, Student's *t*-tests were used. The relationship between WHOQOL-100 and age was examined using Pearson correlations. The data were processed by means of the Statistical Package for the Social Sciences (SPSS, version 10.0 for Windows).

3. Results

3.1. Subjects

Of the 495 participants, 44.2% were male and 55.8% female. The mean age of the male participants was 34.6 years (SD = 8.6; range 21–50 years). The mean age of the female participants was 32.6 years (SD = 8.5; range 21–50 years). The following Axis I diagnoses according to DSM IV, as obtained with the SCAN 2.1, were recorded: psychotic disorders ($N = 8$), mood disorders ($N = 165$), anxiety disorders ($N = 95$), substance related disorders ($N = 36$), other disorders ($N = 78$). Axis II diagnoses according to DSM IV (Personality Disorder: PD), as obtained with the SCID-II, were recorded: paranoid PD ($N = 5$), schizoid PD ($N = 11$), schizotypal PD ($N = 3$), antisocial PD ($N = 27$), borderline PD ($N = 71$), histrionic PD ($N = 8$), narcissistic PD ($N = 22$), avoidant PD ($N = 49$), dependent PD ($N = 26$), obsessive-compulsive PD ($N = 24$), PD not otherwise specified ($N = 70$). These numbers are the totals of all diagnoses recorded. Although present, the phenomenon of comorbidity (i.e., the classification of more than one diagnosis on Axis I and/or Axis II) is not discussed here. Also, the so-called V-codes, according to DSM IV, representing mainly psychosocial problems (e.g., partner relational problem, parent–child relational problem, etc.), are not mentioned.

3.2. Content validity

3.2.1. Skewness and kurtosis

For each WHOQOL-100 item, the skewness and kurtosis were calculated. Four items were excluded because of values deviating too much from prevailing skewness and/or kurtosis criteria: Item 33 (i.e., healthiness of the environment; skewness -0.20 ; kurtosis 0.75 ; facet physical environment), Item 34 (i.e., worries about noise in the environment; skewness 1.10 ; kurtosis 0.69 ; facet physical environment), Item 35 (i.e., problems with transport; skewness 1.11 ; kurtosis 0.54 ; facet transport), and Item 36 (i.e., impairments in life through difficulties with transport; skewness 1.14 ; kurtosis 0.36 ; facet transport). As a result, the facets physical environment and transport were excluded from the other analyses. Further psychometric analyses were performed with the remaining 23 facets (including overall QOL and general health, i.e., the general evaluative facet).

3.2.2. Exploratory factor analysis

A principal components analysis (PCA) with varimax rotation was carried out on 22 facets, excluding the general evaluative facet. The Scree plot [9] indicated four factors: physical health (I), psychological health (II), social relationships (III), and environment (IV). However, also three-, and five-factor solutions were scrutinized. These analyses revealed that the four-factor solution most closely resembled earlier findings with the WHOQOL-100 by the WHOQOL group [38],

Table 1

Factor loadings^a from the rotated factor structure (principal component analysis with varimax rotation)

WHOQOL facets	Component			
	I	II	III	IV
Pain and discomfort	-0.72			
Activities of daily living	0.72			
Energy and fatigue	0.70			
Working capacity	0.68	0.39		
Dependence on medication and treatments	-0.68			
Negative feelings ^c	-0.61	-0.45		
Mobility	0.59			
Sleep and rest	0.52			
Spirituality/religion/personal beliefs		0.77		
Self-esteem		0.75		
Positive feelings		0.67	0.39	
Thinking, learning, memory, and concentration	0.36	0.52		
Participation in, and opportunities for recreation ^c		0.49	0.40	0.37
Body image and appearance		0.41		
Social support			0.72	
Personal relationships			0.71	
Sexual activity			0.70	
Financial resources				0.73
Home environment				0.69
Opportunities for acquiring new information and skills				0.65
Health and social care, availability and quality				0.57
Physical safety and security	0.36			0.44

^a Only factor loadings $>\pm 0.35$ are presented. ^b Factor loadings of facets belonging to each of the four domains are in bold. ^c Facet negative feelings is assigned to component II rather than to component I and facet participation in, and opportunities for recreation is assigned to component IV rather than to component II. For explanation: see section on Discussion (four-factor structure of WHOQOL). ^d I, physical health; II, psychological health; III, social relationships, IV, environment. ^e Order of facets is determined by assignment to component, and factor loadings.

and Power et al. [28]. The PCA results are presented in Table 1.

3.2.3. Confirmatory factor analysis

Because the exploratory factor analysis indicated that the four-domain structure also appeared in the current psychiatric sample, CFA was performed. In line with the exploratory factor analysis, CFA at facet level indeed supported the four-domain solution. With the exception of the two facets, physical environment and transport, which were left out of the instrument, the current CFA-outcome revealed the same struc-

ture as reported by the WHOQOL group [39] regarding the WHOQOL-100. This solution is presented in Fig. 1. This figure shows that the four factors load onto a second order factor, representing global QOL. Compared with the corresponding analysis on the original field trial data set of the WHOQOL-100 [39], similar fit indices were found in case of the present psychiatric population. When six pairs of error variances were allowed to covary (i.e., pain and negative affect, leisure and positive affect, thinking and self-esteem, safety and home environment, finances and home environment, and finally accessibility and quality of health care ver-

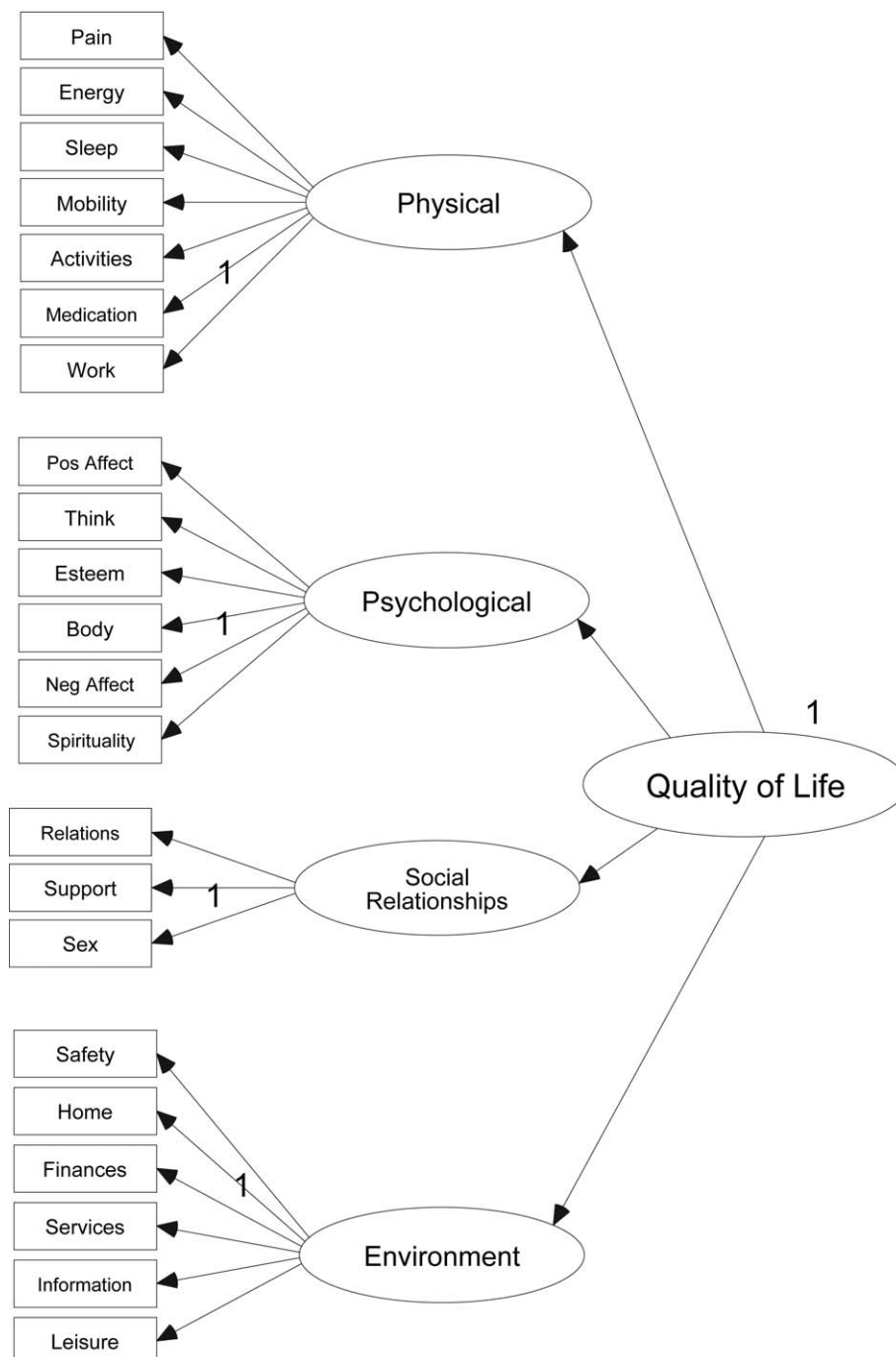


Fig. 1. Four-domain confirmatory factor analysis model.

Table 2
Construct validity ($N = 495$)^a

WHOQOL-100 facets	Anx	Ago	Dep	Som	In	Sens	Hos	Sleep	PSSS
Overall quality of life and general health	–0.41	–0.30	–0.56	–0.40	–0.46	–0.43	–0.28	–0.40	0.39
<i>Physical health</i>	–0.53	–0.44	–0.58	–0.64	–0.59	–0.46	–0.35	–0.59	0.22
Pain and discomfort ^b	0.41	0.30	0.41	0.44	0.35	0.34	0.23	0.28	–0.14
Energy and fatigue	–0.41	–0.27	–0.49	–0.53	–0.50	–0.37	–0.21	–0.38	0.19
Sleep and rest	–0.36	–0.31	–0.39	–0.41	–0.40	–0.35	–0.31	–0.77	0.21
Mobility	–0.24	–0.28	–0.24	–0.41	–0.30	–0.21	–0.19	–0.27	
Activities of daily living	–0.45	–0.36	–0.50	–0.52	–0.55	–0.40	–0.27	–0.40	0.21
Dependence on medication or treatments ^b	0.42	0.37	0.43	0.44	0.36	0.31	0.23	0.35	
Working capacity	–0.40	–0.30	–0.48	–0.47	–0.51	–0.34	–0.29	–0.42	0.17
<i>Psychological health</i>	–0.45	–0.32	–0.63	–0.41	–0.56	–0.53	–0.35	–0.41	0.30
Positive feelings	–0.37	–0.27	–0.57	–0.27	–0.42	–0.44	–0.30	–0.30	0.39
Cognitive functions	–0.35	–0.23	–0.44	–0.39	–0.62	–0.41	–0.28	–0.32	0.18
Self-esteem	–0.39	–0.28	–0.55	–0.34	–0.48	–0.47	–0.31	–0.36	0.22
Body image and appearance	–0.19	–0.18	–0.29	–0.21	–0.23	–0.33	–0.17	–0.21	
Negative feelings ^b	0.56	0.38	0.67	0.47	0.55	0.47	0.33	0.43	–0.30
Spirituality, religion, and personal beliefs			–0.23		–0.16	–0.16	–0.13	–0.15	0.14
<i>Social relationships</i>	–0.25	–0.22	–0.41	–0.21	–0.33	–0.41	–0.21	–0.22	0.68
Personal relationships	–0.28	–0.22	–0.46	–0.20	–0.37	–0.44	–0.23	–0.24	0.57
Social support	–0.22	–0.19	–0.32	–0.19	–0.27	–0.38	–0.23	–0.15	0.76
Sexual activity		–0.13	–0.22	–0.13	–0.17	–0.20	–0.07	–0.14	0.33
<i>Environment</i>	–0.38	–0.30	–0.47	–0.36	–0.43	–0.43	–0.36	–0.35	0.35
Physical safety and security	–0.41	–0.36	–0.33	–0.30	–0.31	–0.34	–0.22	–0.30	
Home environment	–0.19	–0.13	–0.27	–0.14	–0.23	–0.24	–0.21	–0.16	0.23
Financial resources	–0.13	–0.12	–0.23	–0.20	–0.20	–0.23	–0.26	–0.19	0.17
Health and social care	–0.23	–0.14	–0.28	–0.26	–0.26	–0.25	–0.22	–0.18	0.27
New information and skills	–0.26	–0.19	–0.32	–0.28	–0.32	–0.32	–0.25	–0.21	0.25
Recreation	–0.37	–0.31	–0.51	–0.31	–0.44	–0.39	–0.30	–0.38	0.42

^a All correlations are significant at the 0.01 level (2-tailed); non-significant correlations are not reported. ^b Facets pain and discomfort, negative feelings, and dependence on medication or treatments are negatively framed. They were recoded when calculating domain scores. ^c Anx, anxiety; Ago, phobic anxiety; Dep, depression; Som, somatization; In, insufficiency of thinking and acting; Sens, paranoid ideation and interpersonal sensitivity; Hos, hostility; Sleep, sleep difficulty. ^d Domains are presented in italics. Strong correlations, discussed in the section on Results, are in bold. ^e Cognitive functions: thinking, learning, memory, and concentration; health and social care: health and social care, availability and quality; new information and skills: opportunities for acquiring new information and skills; recreation: participation in and opportunities for recreation.

sus information), a satisfactory comparative fit index was obtained: CFI = 0.90.

3.3. Construct validity

The SCL-90 and the PSSS scores were correlated with the 23 facets and the four domains of the WHOQOL-100. The results are presented in Table 2.

As can be seen in Table 2, almost all facets and domains of the WHOQOL-100 were significantly correlated with almost all SCL-90 dimensions and the PSSS score. In accordance with our expectations, the SCL-90 subscales correlated higher with WHOQOL-100 domains physical health (average correlation = –0.52) and psychological health (average correlation = –0.46) than with the domains social relationships (average correlation = –0.28) and environment (average correlation = –0.39). In general, our expectations concerning the QOL facets were also confirmed. The facets of the domain physical health had the strongest associations with the SCL-90 dimension somatization, whereas the domain psychological health and its facets correlated highest with the SCL-90 dimension depression. Finally, the domain social relationships and its facets had the strongest correlations with the PSSS score.

3.4. Reliability

The results regarding the internal consistency of the WHOQOL-100 are presented in Table 3. With regard to the domains, Cronbach's alpha's ranged from 0.64 (physical health) to 0.84 (environment). At the facet level, the internal consistency ranged from 0.62 for the personal relationships to 0.93 for the sleep and rest and the working capacity.

3.5. Demographics

3.5.1. Age

Significant correlations ($p < 0.01$) between age and WHOQOL-100 scores were sparse and relatively low (r 's ranging from 0.12 to 0.22). At the facet level, age had a positive correlation with the facet body image and appearance. Negative correlations were found with the facets dependence on medication or treatments, personal relationships, social support, and sexual activity as well as the domain social relationships. Regarding the negative correlations found between the domain social relationships with both age and perceived social support, one could expect age also to be negatively correlated with the PSSS score. This indeed was the case ($r = -0.26$; $p < 0.01$).

Table 3
Internal consistency of the WHOQOL-100

WHOQOL-100 domains and facets	Cronbach's alpha ^a	
Overall quality of life and general health	0.80	
<i>Physical health</i>	0.80	0.84*
Pain and discomfort	0.74	
Energy and fatigue	0.89	
Sleep and rest	0.93	
Mobility	0.89	
Activities of daily living	0.87	
Depence on medication or treatments	0.86	
Working capacity	0.93	
<i>Psychological health</i>	0.81	0.79*
Positive feelings	0.84	
Thinking, learning, memory, and concentration	0.74	
Self-esteem	0.82	
Body image and appearance	0.92	
Negative feelings	0.82	
Spirituality, religion, and personal beliefs	0.84	
<i>Social relationships</i>	0.85	0.67*
Personal relationships	0.62	
Social support	0.78	
Sexual activity	0.89	
<i>Environment</i>	0.87	0.75*
Physical safety and security	0.76	
Home environment	0.84	
Financial resources	0.90	
Health and social care, availability and quality	0.75	
Opportunities for acquiring new information and skills	0.76	
Participation in and opportunities for recreation	0.77	

^a Cronbach's alpha's were calculated at item level, except for the values marked with *, which were calculated at facet level.

3.5.2. Sex

With regard to QOL, male participants had significantly higher scores on the facets energy and fatigue ($F = 7.16$, $df = 432$, 01 , $p < 0.001$) and body image and appearance ($F = 1.92$, $df = 493$, $p < 0.001$). Female participants had significantly higher scores on the facets positive feelings ($F = 0.30$, $df = 493$, $p = 0.02$), personal relationships ($F = 0.08$, $df = 470$, 61 , $p = 0.04$), and the domain social relationships ($F = 0.11$, $df = 471$, 01 , $p = 0.04$).

4. Discussion

The aim of the present study was to examine the psychometric properties of the WHOQOL-100 in a general population of adult psychiatric outpatients.

With regard to content validity, the facets physical environment and transport were excluded on the basis of frequency distribution problems. The vast majority of the outpatients were very satisfied with their physical environment and were not, or only slightly, impaired in their lives through difficulties with (their possibilities of) transport. Looking at the region the participants live in, i.e., the city of Tilburg and its surroundings, it can be said that the local environmental

circumstances and infrastructural organization of the region are, generally spoken, good. The relative unilateral answering pattern on the questions concerning these subjects seems to be in accordance with these circumstances.

Exploratory factor analysis revealed the existence of a four-factor structure. CFA supported this finding. The existence of a four-factor structure of the WHOQOL-100 was found earlier [28,38]. Only two facets deviated from these earlier findings, obtained in non-psychiatric samples: negative feelings, and participation in and opportunities for recreation. These differences can be explained by the use of a CFA in these earlier studies. The two facets mentioned had substantial cross-loadings with the factors they originally belonged to. Because of these high cross-loadings and the good internal consistency of the four factors, it was decided to use the same factor structure as described by the WHOQOL group [38], and Power et al. [28]. The finding that a four-factor structure is not only present in a general population but also in a population of psychiatric outpatients demonstrates that the WHOQOL-100 truly is a *generic* instrument. On the basis of these results, it can be concluded that the content validity of the WHOQOL-100 is good.

We expected that QOL would decrease in relation to (i) an increase of (a broad spectrum of) psychiatric symptoms, especially those caused by depression, (ii) an increase of (a broad spectrum of) somatic complaints, and (iii) a decrease of perceived social support. The associations that were found between the WHOQOL-100, the SCL-90 and the PSSS, confirm these hypotheses. Regarding the SCL-90 dimension depression, high correlations were indeed found with a number of specific WHOQOL-100 facets, i.e., positive feelings, self-esteem, and negative feelings. These findings are in accordance with earlier research outcomes [2,5,33]. Other correlations also support the presence of good construct validity. Amongst these are the high negative correlations between SCL-90 dimension somatization, and the WHOQOL-100 facets pain and discomfort, energy and fatigue, and mobility. Furthermore, we found the expected links between SCL-90 dimension sleep difficulty and the WHOQOL-100 facet sleep and rest. The PSSS score had high and positive correlations with the WHOQOL facets personal relationships and social support. All these findings provided empirical support for the construct validity of the WHOQOL-100, which, on this basis, is qualified as good.

Regarding associations between age (21–50) and QOL, the following picture emerged. The older one gets, the more satisfied one is with its body image and appearance and the more one feels dependent on medication or treatments. In addition, higher age coincided with less satisfaction with ones social relationships. With regard to sex and QOL, male participants had more energy and were more positive about their physical appearance. Female participants scored higher on the scales for positive feelings and social relationships. These findings support the face validity of the WHOQOL-100.

5. Conclusion

The results of the present study show that the WHOQOL-100 has good reliability, content validity and construct validity, and therefore is a suitable instrument for measuring QOL in a population of adult psychiatric outpatients. Because the WHOQOL-100 is regarded to be a cross-cultural sensitive instrument, we expect that the results of the present study can be generalized to populations of adult psychiatric outpatients worldwide.

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